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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/933,521	08/20/2001	William Bell	1867-00202	7098

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EXAMINER	
BISSETT, MELANIE D	
ART UNIT	**PAPER NUMBER**
1711	9

DATE MAILED: 03/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS 9

Office Action Summary	Application No.	Applicant(s)	
	09/933,521	BELL ET AL.	
	Examiner	Art Unit	
	Melanie D. Bissett	1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 31 December 2002.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-19,24,25 and 28-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-19,24,25 and 28-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The rejection based on 35 USC 112 has been withdrawn based on the applicant's amendment B filed 12/31/02. However, the rejections based on 35 USC 102 and 103 have been maintained.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 15, 17-19, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Droege.

4. From a prior Office action:

> 5. Droege discloses open cell carbon foams made by pyrolizing polyimide films, where the foams have densities of 300-900 mg/cm^3 (0.3-0.9 g/cm^3), surface areas of 200-800 m^2/g, and electrical capacitances of 10-80 F/g (col. 13 lines 50-59). In this case, it seems that the foams would have a volumetric capacitance of 3-72 F/cm^3 (ex. 10 F/g x 0.3 g/cm^3 = 3 F/cm^3). Droege teaches the carbon foams as having pore sizes of 10-25 nm (col. 14 lines 2-4). Since the reference shows the carbon foams as useful in single applications and results from homogeneous mixtures, it is the examiner's position that Droege teaches monolithic structures (col. 12 lines 41-62). Additives such as metal fibers may also be included (col. 14 lines 49-65).

5. Regarding the measurement of capacitance using a non-aqueous electrolyte, the capacitance of the carbon materials is related to the mobility of the electrolyte, where pore size, surface area, and density can all be factors. It is the examiner's position that the carbon foams of Droege would inherently possess the applicant's claimed capacitance measured using non-aqueous electrolyte since the reference encompasses the applicant's claimed pore size, density, and surface area properties (Table 1).

6. Claim 14 is rejected under 35 U.S.C. 102(e) as being anticipated by Firsich.

7. From a prior Office action:

> 7. Firsich discloses porous carbon monoliths having variable densities, surface areas of over 500 m^2/g, electrical conductivities of about 25 s/cm, capacitances of over 200 F/g, where the carbon materials are made by carbonizing polymer powder/carbon powder blends (col. 2 line 49-col. 3 line 9). An example shows a carbon material having a density of 0.75 g/cc, electrical conductivity of 20 S/cm, and a surface area of 750 m^2/g (example 1). Pore sizes should be optimized for mesoporosity, where Firsich cites "mesoporosity" as having pore diameters of 20-100 Å (2-10 **[nm]***) (col. 4 lines 50-53). Thus, the reference teaches carbon materials having densities of greater than 0.5 g/cc. It is noted that claim 14 does not specify a process, since claim 1 has been cancelled. However, it is the examiner's position that the resulting carbon monolith of Firsich's invention would have the same structure and composition as a carbon monolith of the applicant's claimed invention, as evidenced by the same properties.
>
> * Note that the conversion from Å has been corrected to cite 2-10 nm.

8. Regarding the measurement of capacitance using a non-aqueous electrolyte, the capacitance of the carbon materials is related to the mobility of the electrolyte, where pore size, surface area, and density can all be factors. It is the examiner's position that the carbon materials of Firsich would inherently possess the applicant's claimed capacitance measured using non-aqueous electrolyte since the reference encompasses the applicant's claimed pore size, density, and surface area properties (example 1).

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 15-19, 24-25, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Firsich in view of Droege.

11. From a prior Office action:

10. Firsich applies as above for the carbon monolith materials. Carbon materials can be pressed to thickness of 15 mils to one inch (0.38-25.4 mm), suggesting monoliths having a dimension of greater than 2 mm. Firsich teaches carbon materials having capacitances of 120-180 F/g before further treatment and capacitances of 200-260 F/g after a sulfonation treatment (col. 7 lines 14-20). The capacitance of the carbon of example 1 is shown as 200-240 F/g. In this case, it seems the carbon material would have a volumetric capacitance of 150-180 F/cc. Since carbon powder having small particle diameters can be included in the polymer mixture to be carbonized (col. 6 lines 16-23), it is the examiner's position that the reference teaches the addition of high surface area powders. However, the reference does not suggest porous carbon materials having pore diameters greater than 10 **[nm]***.

11. Droege teaches mesoporous distributions as encompassing pore sizes of 5-50 nm, where a specified embodiment suggests pore sizes of 10-25 nm (col. 13 line 60-col. 14 line 4). Droege suggests that the mesopore size distribution serves to improve the formation of electrical double layer and increase in energy storage characteristics (col. 14 lines 5-14). Since Firsich teaches the use of mesoporous carbon monoliths and the desire for high energy storage characteristics (col. 2 lines 59-61), it is the examiner's position that it would have been prima facie obvious to form carbon materials having pore sizes greater than 10 nm to optimize energy storage characteristics and formation of electrical double layers.

* Note the correction from μm to nm.

12. Regarding the measurement of capacitance using a non-aqueous electrolyte, the capacitance of the carbon materials is related to the mobility of the electrolyte, where pore size, surface area, and density can all be factors. It has been the examiner's position that it would have been prima facie obvious to increase pore sizes to increase the energy storage characteristics. Also, Firsich teaches the applicant's claimed density and surface area (example 1). It is the examiner's position that the carbon materials of Firsich and Droege would inherently possess the applicant's claimed capacitance measured using non-aqueous electrolyte since the reference encompasses the applicant's claimed pore size, density, and surface area properties.

13. Claims 15, 17-18, and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tan in view of Droege.

14. From a prior Office action:

> 13. Tan discloses porous monolithic carbon films having a volumetric capacitance around 200 F/cc, a density between 0.7-1 g/cc, and a surface area greater than 1000 m^2/g (col. 2 lines 8-14, lines 34-40). Aqueous and non-aqueous electrolytes are used to form a double layer capacitor (col. 1 lines 25-48). However, Tan teaches pore sizes of 6-15 Å (0.6-1.5 nm) (col. 2 lines 61-64). However, Droege has suggested that the mesopore size distribution, including pore sizes of 10-25 nm, serves to improve the formation of electrical double layer and increase in energy storage characteristics (col. 14 lines 5-14). Thus, it is the examiner's position that it would have been prima facie obvious to form carbon materials having pore sizes greater than 10 nm to optimize energy storage characteristics and formation of electrical double layers.

15. Regarding the measurement of capacitance using a non-aqueous electrolyte, the capacitance of the carbon materials is related to the mobility of the electrolyte, where pore size, surface area, and density can all be factors. It has been the examiner's position that it would have been prima facie obvious to increase pore sizes to increase the energy storage characteristics. It is the examiner's position that the carbon materials of Tan and Droege would inherently possess the applicant's claimed capacitance measured using non-aqueous electrolyte since the reference encompasses the applicant's claimed pore size, density, and surface area properties.

16. Regarding new claim 29, it is noted that Tan teaches propylene carbonate electrolyte as having good ionic conductivity but negligible electronic conductivity (col. 1 lines 25-34).

17. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tan in view of Droege as applied to claims 15, 17-18, and 28-29 above, and further in view of Nissen et al.

18. Tan and Droege apply as above, teaching the use of propylene carbonate organic electrolytes in double layer capacitors but failing to teach an electrolyte comprising NEt_4BF_4 in propylene carbonate. Nissen teaches double layer capacitors, where electrolytes using tetraalkyl-ammonium salts promote higher capacitance and higher power capability than other electrolytes (col. 4 lines 34-58). Tetraethylammonium tetrafluoroborate salts and propylene carbonate electrolyte solvents are both mentioned as preferable materials to form the electrolyte solution (col. 4 line 59-col. 5 line 7). Thus, it is the examiner's position that it would have been prima facie obvious to use NEt_4BF_4 in propylene carbonate as the electrolyte in the invention of Tan and Droege to provide capacitors having improved capacitance and power capabilities.

Response to Arguments

19. Although the applicant has provided an affidavit stating that the carbon materials of the cited references do not exhibit the claimed volumetric capacitance in non-aqueous electrolyte, evidence to support such a statement has not been provided. It is the examiner's position that, since the carbon materials of the cited references anticipate the applicant's claimed pore sizes, surface areas, and densities, the carbon materials of the cited references represent structures at least very similar to those of the present application and would inherently possess the applicant's claimed volumetric capacitance. Thus, absent evidence showing otherwise, the rejections have been maintained.

20. Regarding the applicant's argument that there is no teaching in either Firsich or Droege leading one of ordinary skill in the art to combine the references, the examiner notes the above rejection of paragraphs 10-12, pointing to Firsich's desire for mesoporous carbon capacitors having high energy storage characteristics and Droege's teaching of mesoporous carbon capacitors having improved energy storage resulting from pore size choice. It is the examiner's position that the references are analogous by both teaching mesoporous carbon capacitors and are combinable for this reason.

21. Regarding the applicant's argument that there is no teaching in either Tan or Droege leading one of ordinary skill in the art to combine the references, the examiner notes the above rejection of paragraphs 14-16, pointing to Tan's desire for porous carbon capacitors having high volumetric capacitance and Droege's teaching of mesoporous carbon capacitors having improved energy storage resulting from pore size choice. It is the examiner's position that the references are analogous by both teaching porous carbon capacitors for double layer capacitors and are combinable for this reason.

Conclusion

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie D. Bissett whose telephone number is (703) 308-6539. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

mdb
March 12, 2003

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